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10/615,574	07/08/2003	Arthur J. Redfern	TI-34861	8985
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EXAMINER KASRAIAN, ALLAHYAR				
ART UNIT 2617		PAPER NUMBER		
NOTIFICATION DATE 03/25/2008		DELIVERY MODE ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/615,574

**Applicant(s)**

REDFERN ET AL.

**Examiner**

ALLAHYAR KASRAIAN

**Art Unit**

2617

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 December 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 8-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 8-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SG/US)
- Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Art Unit - Location***

1. The Art Unit location of this application in the USPTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Art Unit 2617.

### ***Remarks***

2. The present Office Action is in response to Applicant's amendment filed on Dec. 12, 2007. **Claims 8-14** are now pending in the present application. **This Action is made FINAL.**

### ***Specification***

3. The objection to specification is withdrawn. The amendment regarding the abstract of the specification received on Dec. 12, 2007 is acknowledged by the Examiner.

4. Applicant's request for changing the first paragraph of page 1 of the specification is acknowledged by the Examiner.

### ***Claim Objections***

5. **Claims 8, 9, 13 and 14** are objected to because of the following informalities:
- a. On **claim 8**, the relation between "upstream", "downstream", "first direction" and "second direction" are not clear. Based on specification the terms "upstream" and "downstream" are the directions for transmitting the set of

symbols, however, it is not clear which direction is upstream and which is upstream.

- b. On **lines 2-3 of claim 8**, replace “referred to as a type 1 symbols” with – wherein a first set of symbols is a type 1 symbols-- after “symbol”;
- c. On **line 14 of claim 8**, replace “referred to as a type 2 symbols” with – wherein a second set of symbols is a type 2 symbols-- after “symbol”;
- d. On **line 16 of claim 8**, replace “referred to as a type 3 symbols” with – wherein a third set of symbols is a type 3 symbols-- after “symbol”;
- e. On **lines 3-4 of claim 9**, replace “the first set of symbols referred to as a type 1 symbols” with –wherein a first set of symbols is a type 1 symbols-- after “symbol”;
- f. On **lines 6-7 of claim 9**, replace “the second set of symbols referred to as a type 2 symbols” with –wherein a second set of symbols is a type 2 symbols-- after “symbol”;
- g. On **lines 9-10 of claim 9**, replace “the third set of symbols referred to as a type 3 symbols” with –wherein a third set of symbols is a type 3 symbols-- after “symbol”;
- h. On **line 1 of claim 13**, insert –the-- before “first”;
- i. On **line 1 of claim 13**, insert –the-- before “second”;
- j. On **line 3 of claim 14**, acronym PSD should be written in words as what it stands for;
- k. On **line 3 of claim 14**, insert –a-- before “first”;

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- l. On line 3 of claim 14, insert --a-- before "second";
- m. On line 6 of claim 14, acronym SNR should be written in words as what it stands for.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

- 6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

- 7. **Claims 9-13** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

**Claim 9** recites the new matter of "an article of manufacture" which was not described in the original specification.

**Claims 10-13** are also rejected by the virtue of their dependency on **claim 9**.

***Claim Rejections - 35 USC § 101***

- 8. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

9. **Claims 9-13** are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Consider **claim 9**, the claimed subject matter is a non-statutory since it claims a data structure (hyperframe). (See lines 25-26 of page 2 of the specification “a hyperframe structure which mixes frames with differing upstream-downstream balance.”)

Data structures not claimed as embodied in computer-readable media are descriptive material per se and are not statutory because they are not capable of causing functional change in the computer. See, e.g., Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory). Such claimed data structures do not define any structural and functional interrelationships between the data structure and other claimed aspects of the invention which permit the data structure's functionality to be realized. In contrast, a claimed computer-readable medium encoded with a data structure defines structural and functional interrelationships between the data structure and the computer software and hardware components which permit the data structure's functionality to be realized, and is thus statutory (MPEP 2106.01 [R-5]).

**Claims 10-13** are also rejected by the virtue of their dependency on **claim 9**.

***Claim Rejections - 35 USC § 102***

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. **Claims 8-13** are rejected under 35 U.S.C. 102(b) as being anticipated by **Chow (US Patent # 6009122)**.

Consider **claim 8**, Chow discloses a method of initialization for a multitone system, comprising:

comparing upstream and downstream data rates for a two-band duplex to threshold data rates (FIG. 11, col. 16 lines 36-54 and col. 17 lines 1-4); and

when said data rates fail to meet said threshold data rates comparing data rates for a hybrid duplex to said threshold data rates, wherein said hybrid duplex uses hyperframes with structure (FIG. 11, col. 16 lines 36-54 and col. 17 lines 1-4; FIG. 7, col. 13 lines 15-17 for hybrid circuit 706):

a first set of symbols, referred to as a type 1 symbols, for transmission in a first direction in a first set of subchannels and transmission in a second direction in a second set of subchannels where said first and second directions differ and said first and second sets are different (FIG. 4B for 9-1-9-1 mixture, col. 9 lines 14-31, col. 10 lines 21-56; consider a first set of symbols as frames with subchannels in downstream direction and subchannels in frames with A, B and C in upstream direction); and

a second set of symbols, referred to as a type 2 symbols, where transmission is only in the first direction in the first set of subchannels (FIG. 4B for 9-1-9-1 mixture, col.

9 lines 14-31, col. 10 lines 21-56; consider subchannels in frames D, E, F and G in upstream direction as the second set of symbols); and

a third set of symbols, referred to as a type 3 symbols, where transmission is only in the first direction in subchannels different from that of the set of subchannels used for type 2 symbols (FIG. 4B for 9-1-9-1 mixture, col. 9 lines 14-31, col. 10 lines 21-56; consider subchannels in frames H and J in upstream direction as the third set of symbols).

Consider **claim 9**, Chow discloses an article of manufacture in the form of a hyperframe for use in a communication system including a plurality of processor circuitry operable to provide a discrete multitone system, said article of manufacture comprising (FIG. 4A and 4B, consider superframe as hyperframe):

a first set of symbols, manufactured by the plurality of processor circuitry from the data bits input, the first set of symbols referred to as a type 1 symbols, where transmission is in a first direction using a first direction set of subchannels and second direction using a second direction set of subchannels (FIG. 4B for 9-1-9-1 mixture, col. 9 lines 14-31, col. 10 lines 21-56; consider a first set of symbols as frames with subchannels in downstream direction and subchannels in frames with A, B and C in upstream direction);

a second set of symbols, manufactured by the plurality of processor circuitry from the data bits input, the second set of symbols referred to as a type 2 symbols, where transmission is only in the first direction using the first direction set of subchannels (FIG.

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4B for 9-1-9-1 mixture, col. 9 lines 14-31, col. 10 lines 21-56; consider subchannels in frames D, E, F and G in Upstream direction as the second set of symbols); and

a third set of symbols, manufactured by the plurality of processor circuitry from the data bits input, the third set of symbols referred to as a type 3 symbols, where transmission is only in the first direction using subchannels different from that of the set of subchannels used for type 2 symbols (FIG. 4B for 9-1-9-1 mixture, col. 9 lines 14-31, col. 10 lines 21-56; consider subchannels in frames H and J in upstream direction as the third set of symbols),

wherein the total of symbols is  $N$  symbols comprised of  $n_1$  type 1 symbols,  $n_2$  type 2 symbols and  $n_3$  type 3 symbols, where  $n_1 + n_2 + n_3 = N$  (consider  $n_1 = 12$  for type 1,  $n_2 = 4$ , and  $n_3 = 2$ , then  $N = 18$  total of symbols in upstream or downstream direction).

Consider **claim 10 as applied to claim 9 above**, Chow further discloses the set of subchannels used by the type 2 symbols for transmission in the first direction does not include the set of subchannels used for transmission in the second direction by the type 1 symbols (FIG. 4B, the set of subchannels in frames D, E, F, and G in Upstream direction do not include the set of subchannels in frames A, B and C in Upstream direction).

Consider **claim 11 as applied to claim 9 above**, Chow further discloses the set of subchannels used by the type 3 symbols for transmission in the first direction

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includes the set of subchannels used for transmission in the second direction by the type 1 symbols (FIG. 4B, the set of subchannels in frames H and J in Upstream direction do not include the set of subchannels in frames A, B and C in Upstream direction).

Consider **claim 12 as applied to claim 9 above**, Chow further discloses the N symbols are ordered such that there are  $n_1$  type 1 symbols, followed by 1 type 2 symbol, followed by  $n_3$  type 3 symbols, followed by 1 type 2 symbol (the arrangement could be type 1 with  $n_1 = 10$  having 9 subchannels downstream and 1 subchannels in frame A upstream followed by type 2 with B subchannel in upstream and followed by type 3 with  $n_3=5$  with subchannels in frames B, C, D, E and F followed by subchannels in frame G as type 2, then  $N = 18$ ).

Consider **claim 13 as applied to claim 9 above**, Chow further discloses first direction is downstream and second direction is upstream (FIG. 4B).

### ***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of

the claims under 35 U.S.C. 103(a), the Examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the Examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

13. **Claim 14** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Chow (US Patent # 6009122)** in view of **Kumar (US Patent Application Pub. # 20030086487)**.

Consider **claim 14**, Chow discloses a method of initializing a discrete multitone system with a hyperframe in a communication circuitry including a signal processor, comprising:

determining a target data rate for the first and second directions including type 1 and type 3 symbols in the SNR measurement phase (FIG. 11 for steps 1102 and 1104, col. 16 lines 36-54; FIG. 4B for any arrangement between frame to define type 1, 2 and 3);

performing a bit loading for the type 1, type 2 and type 3 symbols to determine the data rates supported in the first and second directions for each type of symbol (FIG. 11 for steps 1108 and 1110, col. 16 lines 55-67); and

signal processor manufacturing the hyperframe, said manufacturing comprising (FIG. 5, col. 11 lines 27-67, col. 12 lines 1-26):

choosing all type 1 symbols if the type 1 symbol is able to meet the target data rates for the first and second directions (FIG. 11 for step 1106, col. 16 lines 36-54, selecting a superframe format); and

choosing a mix of type 1, type 2 and type 3 symbols to most closely meet the target data rates for the first and second directions if all type 1 symbols are unable to meet the target data rate (FIG. 11 for step 1106, col. 16 lines 36-54, selecting a superframe format).

However, Chow fails to disclose determining the allowed set of PSD masks for first and second directions of type 1, type 2 and type 3 symbols.

In the same field of endeavor, Kumar discloses determining the allowed set of PSD masks for first and second directions of type 1, type 2 and type 3 symbols (FIGS. 3, 4 and 5 par. 0016, and description in par. 0010-0015, consider any combination between a+x channels to define type 1, type 2 and type 3).

Therefore, it would have been obvious to a person of ordinary skills in the art at the time the invention was made to incorporate PSD mask for upstream and downstream directions as shown by Kumar to the superframe alignment management disclosed by Chow for purpose of shaping the power spectrum to achieve the performance and power management required.

### ***Response to Arguments***

14. Applicant's arguments with respect to claims 8-14 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

15. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure.

- a. Modlin et al. (U.S. Patent # 6480475 B1) disclose Method and system for accommodating a wide range of user data rates in multicarrier data transmission system.
- b. Peeters (U.S. Patent # 7269209 B2) discloses Discrete multitone transmission and reception.
- c. Grube et al. (U.S. Patent # 5606577) disclose Method and apparatus for DAMT transmitter having a data for matter coupled directly to a constellation encoder
- d. Ginis et al. (U.S. Patent Application Publication # 20030086514) disclose Dynamic digital communication system control.

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

17. Any response to this Office Action should be **faxed to (571) 273-8300 or mailed to:**

Commissioner for Patents  
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**Hand-delivered responses** should be brought to

Customer Service Window  
Randolph Building  
401 Dulany Street  
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Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Allahyar Kasraian whose telephone number is (571) 270-1772. The Examiner can normally be reached on Monday-Thursday from 8:00 a.m. to 5:00 p.m.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Rafael Pérez-Gutiérrez can be reached on (571) 272-7915. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 571-272-4100.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist/customer service whose telephone number is (571) 272-2600.

*Allahyar Kasraian*  
A.K./ak  
March 14, 2008

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/Rafael Pérez-Gutiérrez/

Supervisory Patent Examiner, Art Unit 2617